QUALITY ASSURANCE REPORT/QUALITY CONTROL REPORT

AEE/QA/PR/86/2022-23, DATE: 27/09/2023		
Name of Work	:	Improvements to Roads and drain at Chokkanahalli and Thirumenahalli Surrounding area in Ward No.06 Kogilu Estimated cost 60.00 Lakhs
Job Code	:	006-23-000010
Bill No.& Amount	:	**1st&Final Bill.Rs. 62,95,000.00(Including GST)**
Name of Agency	:	**M/s K R Constructions PROP. C Mahesh**
Type of Test Performed	:	Rebound Hammer test as per IS13311-(2)-1992&Bitumen Content and Gradation test as per Table 500.10&Table 500.17 MoRTH V Revision.
Materials on which Tests Was Performed	:	1. RCC Drain wall (M20) 2. Precast cover slab(M20) 3. Culvert Slab (M25) 4. Dense Bituminous Concrete (Grade II) 5. Bituminous Concrete (Grade II)
Officers present during inspection	:	1. Sri. Mahantesh AE- Ward No 06 2. Smt. L.Varalakshmi EE-Quality Assurance 3. Sri .K.M.Yadukrishna AEE-Quality Assurance
Project Management Consultants	:	Civil Pro
Observations	:	➢ NDT (Rebound hammer test) and Bitumen content & Gradation test was conducted by Project Management Consultants representative at random locations in presence of AE(Ward No.06) along with EE QA division& AEE QA division. ➢ The Rebound Hammer Test was conducted randomly on RCC Drain wall (M20), Precast cover slab (M20), Culvert Slab (M25) and also Bitumen content & Gradation Test were conducted for DBM (Grade II) & BC (Grade-II). The readings and results are recorded by the PMC consultants. ➢ The readings of Rebound Hammer Test and Bitumen Content & Gradation Test results are tabulated and analysis of test results done by PMC is here by furnished. ➢ The location wise test results are reproduced in the tables shown below.
Test Locations	:	**Location 1**: Sapthagiri Enclave Main Road, Thirumenahalli (Infront of Sapthagiri Enclave Board, Infront of empty site next to YOYO Sports, Infront of YOYO Sports arena, Infront of empty site next to new building) **Location 2**: Sapthagiri Enclave Main Road, Thirumenahalli (opp to Vacant land, Opp to Laxmi Narasimha Nilaya House, Opp to Vacant Land)

K.M Hulli P
27/9/23
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪವಿಭಾಗ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

Table-01: Bitumen Content and gradation Test Results for Sapthagiri Enclave Main Road, Thirumenahalli random locations

DBM- (GRADE-II)

Landmark/Location	Infront of Sapthagiri Enclave Board	Infront of empty site next to YOYO Sports	Infront of YOYO Sports arena	Infront of empty site next to new building
Description	Trail 1	Trail 2	Trail 3	Trail 4
1.Initial weight of sample (gms) w1	336	348	331	332
2. final weight of sample after extraction (gms) w2	322.5	334	318	318.5
3. Initial weight of filter paper (gms) w3	4	4	4	4
4. Final weight of filter paper (gms) w4	6	6	4	6
5.Increased weight of filter paper (gms) w5=(w4-w3)	2	2	6	2
6. Weight of Bitumen Extracted (gms). w6=w1-w2+w5	15.5	16	15	15.5
7. Bitumen content in % (w6/w1)x100	4.61	4.60	4.53	4.67
8.Average	4.60			

SIEVE SIZE mm	Trail 1				Requirement as per MORTH table 500.10
	Weight Retained, gm	Cumulative Weight Retained	Cumulative %Retained	Cumulative% Passing	
37.5	0	0	0.0	100.0	100
26.5	10	10	3.1	96.9	90 - 100
19	47	57	17.7	82.3	71 - 95
13.2	51	108	33.5	66.5	56 - 80
4.75	87	195	60.5	39.5	38 - 54
2.360	34	229	71.0	29.0	28 - 42
0.300	35	264	81.9	18.1	7 - 21
0.075	44	308	95.5	4.5	2 - 8

SIEVE SIZE mm	Trail 2				Requirement as per MORTH table 500.10
	Weight Retained, gm	Cumulative Weight Retained	Cumulative %Retained	Cumulative% Passing	
37.5	0	0	0.0	100.0	100
26.5	12	12	3.6	96.4	90 - 100
19	52	64	19.2	80.8	71 - 95
13.2	56	120	35.9	64.1	56 - 80
4.75	75	195	58.4	41.6	38 - 54
2.360	36	231	69.2	30.8	28 - 42
0.300	38	269	80.5	19.5	7 - 21
0.075	41	310	92.8	7.2	2 - 8

SIEVE SIZE mm	Trail 3				Requirement as per MORTH table 500.10
	Weight Retained, gm	Cumulative Weight Retained	Cumulative %Retained	Cumulative% Passing	
37.5	0	0	0.0	100.0	100
26.5	16	16	5.0	95.0	90 - 100
19	57	73	23.0	77.0	71 - 95
13.2	50	123	38.7	61.3	56 - 80
4.75	65	188	59.1	40.9	38 - 54
2.360	32	220	69.2	30.8	28 - 42
0.300	39	259	81.4	18.6	7 - 21
0.075	35	294	92.5	7.5	2 - 8

K.M. Ethiraj 27/9/23

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು

SIEVE SIZE mm	Trail 4				Requirement as per MORTH table 500.10
	Weight Retained, gm	Cumulative Weight Retained	Cumulative %Retained	Cumulative% Passing	
37.5	0	0	0.0	100.0	100
26.5	13	13	4.1	95.9	90 - 100
19	55	68	21.4	78.6	71 - 95
13.2	48	116	36.4	63.6	56 - 80
4.75	71	187	58.7	41.3	38 - 54
2.360	31	218	68.4	31.6	28 - 42
0.300	38	256	80.4	19.6	7 - 21
0.075	47	303	95.1	4.9	2 - 8

Table-02: Bitumen Content and gradation Test Results for Prakruthi nagar 2nd Cross, Kogilu random locations BC- (GRADE-II)

Landmark/Location	Infront of Sapthagiri Enclave Board	Infront of empty site next to YOYO Sports	Infront of YOYO Sports arena	Infront of empty site next to new building
Description	Trial 1	Trail 2	Trail 3	Trail 4
1.Initial weight of sample (gms) w1	327	342	329	346
2. final weight of sample after extraction (gms) w2	311	325.5	313	329
3. Initial weight of filter paper (gms) w3	4	4	4	4
4. Final weight of filter paper (gms) w4	6	6	6	6
5.Increased weight of filter paper (gms) w5=(w4-w3)	2	2	2	2
6. Weight of Bitumen Extracted (gms). w6=w1-w2+w5	18	18.5	18	19
7. Bitumen content in % (w6/w1)x100	5.50	5.41	5.47	5.49
8.Average	5.47			

SIEVE SIZE mm	Trail 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cumulative Weight Retained	%Cumulative Retained	% Passing	
19.00	0	0	0.0	100.0	100
13.2	10	10	3.2	96.8	90-100
9.5	58	68	21.9	78.1	70-88
4.75	56	124	39.9	60.1	53-71
2.36	43	167	53.7	46.3	42-58
1.18	30	197	63.3	36.7	34-48
0.6	12	209	67.2	32.8	26-38
0.3	42	251	80.7	19.3	18-28
0.15	15	266	85.5	14.5	12-20
0.075	20	286	92.0	8.0	4-10

SIEVE SIZE mm	Trail 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cumulative Weight Retained	%Cumulative Retained	% Passing	
19.00	0	0	0.0	100.0	100
13.2	8	8	2.5	97.5	90-100
9.5	56	64	19.7	80.3	70-88
4.75	82	146	44.9	55.1	53-71
2.36	38	184	56.5	43.5	42-58
1.18	26	210	64.5	35.5	34-48
0.6	24	234	71.9	28.1	26-38
0.3	25	259	79.6	20.4	18-28
0.15	16	275	84.5	15.5	12-20
0.075	30	305	93.7	6.3	4-10

K.M. ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು 27/9/23
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಘಟಕ –
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

SIEVE SIZE mm	Trail 3				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cumulative Weight Retained	%Cumulative Retained	% Passing	
19.00	0	0	0.0	100.0	100
13.2	12	12	3.8	96.2	90-100
9.5	51	63	20.1	79.9	70-88
4.75	50	113	36.1	63.9	53-71
2.36	63	176	56.2	43.8	42-58
1.18	28	204	65.2	34.8	34-48
0.6	15	219	70.0	30.0	26-38
0.3	31	250	79.9	20.1	18-28
0.15	20	270	86.3	13.7	12-20
0.075	23	293	93.6	6.4	4-10

SIEVE SIZE mm	Trail 4				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cumulative Weight Retained	%Cumulative Retained	% Passing	
19.00	0	0	0.0	100.0	100
13.2	14	14	4.3	95.7	90-100
9.5	49	63	19.1	80.9	70-88
4.75	61	124	37.7	62.3	53-71
2.36	43	167	50.8	49.2	42-58
1.18	24	191	58.1	41.9	34-48
0.6	30	221	67.2	32.8	26-38
0.3	40	261	79.3	20.7	18-28
0.15	22	283	86.0	14.0	12-20
0.075	30	313	95.1	4.9	4-10

Table-03: Rebound Hammer Test Results for Location-2

Sl. No.	Landmark	Member	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2)	Impact Direction
Sample Tested Location at : Sapthagiri Enclave Main Road, Thirumenahalli						
1	opp to Vacant land	RCC Drain wall (M20)	26	28	22	Horizontal
2			30			
3			28			
4			30			
5			26			
6			28			
1	Opp to Laxmi Narasimha Nilaya House	Precast cover slab (M20)	22	24	21	Vertical down
2			24			
3			22			
4			26			
5			22			
6			26			
1	Opp to Vacant Land	Culvert Slab (M25)	28	27	26	Vertical down
2			26			
3			28			
4			30			
5			26			
6			26			

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಮಟ್ಟ ನಿಯಂತ್ರಣ/ಗಿ...

Conclusion:

The file containing **1st & Final bill** has been submitted for the above work to QA department on 23.06.2023 requesting for spot inspection. Engineers of QA/QC division have visited the work spot on 03.08.2023 & 14.09.2023

PMC team was instructed to assess the strength of concrete used RCC Drain Wall (M20), Precast cover Slab (M20), Culvert Slab (M25) by Rebound Hammer Test and also Gradation & Bitumen content test for DBM (Grade II) &BC (Grade-II) on Asphalted road . The Rebound hammer test and Bitumen Content and Gradation Tests were conducted by PMC in presence of engineer in charge of work.

From the test results furnished by PMC, it is concluded that the results of the samplescollected are in accordance with the standards/ specifications mention in the IRC codes. However, the results submitted by the PMC have been reproduced here with for further needful action. The results checked by QA/QC relates only for item tested in the particular location randomly.

Engineer in charge of work shall ensure that work executed as per this bill is not claimed in any other bill /work or else Engineer in charge of work shall be held responsible.

Further, QA/QC directs the Engineer in-charge of the work that all materials used for the work shall be inspected, tested and accepted as per the relevant specifications before incorporation in the work. The frequencies and methods of sampling and testing materials, including those required for definite purpose and not covered by MORT&H specifications shall be in accordance to the relevant IRC or BIS or AASHTO/ASTM/BS standards in order of priority.

All materials or work not conforming to the requirements of the specifications shall be considered unacceptable and rejected. The unacceptable materials or works that are rejected shall be immediately removed unless the defects are corrected and approved by the engineer in-charge of work.

The concerned Engineer in charge of the work shall follow the direction issued by Chief Commissioner Letter number dated 01.08.2022 and 14.09.2022 and take necessary action as appropriate in accordance with the law.

Note: -

This report by QA/QC is pertaining to the work carried out in **1st & final bill** only. Safety precautions shall be taken at work spot to prevent any mishap, injuries or loss of life to general public and construction workers according to guidelines laid down in code of practices.

Engineer in charge of work and Agency shall ensure that if any damages or defects occur pertaining to the executed work within the Defect Liability period (DLP), The same shall be rectified immediately on top priority without fail.

Engineer in charge of work shall ensure that any changes/ modification/change in location in the sanctioned estimate to be got approved by competent authority.

K. M. Hulli
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಘಟಕ-ಮಟ್ಟ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

K.M. 27/9/23

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ –
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು

K.M. 27/9/23

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ -
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

K.M. Hulli P
27/9/23
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ